

Holotype: M.C.Z. No. 80515. On rocks in the cataract of the Surinam River below Kedjo, Dutch Guiana (100 miles up river from Paramaribo), David Fairchild collector, March 3, 1932. Additional paratypes, M.C.Z. No. 80516; Acad. Nat. Sci. Phila., and the University of Michigan.

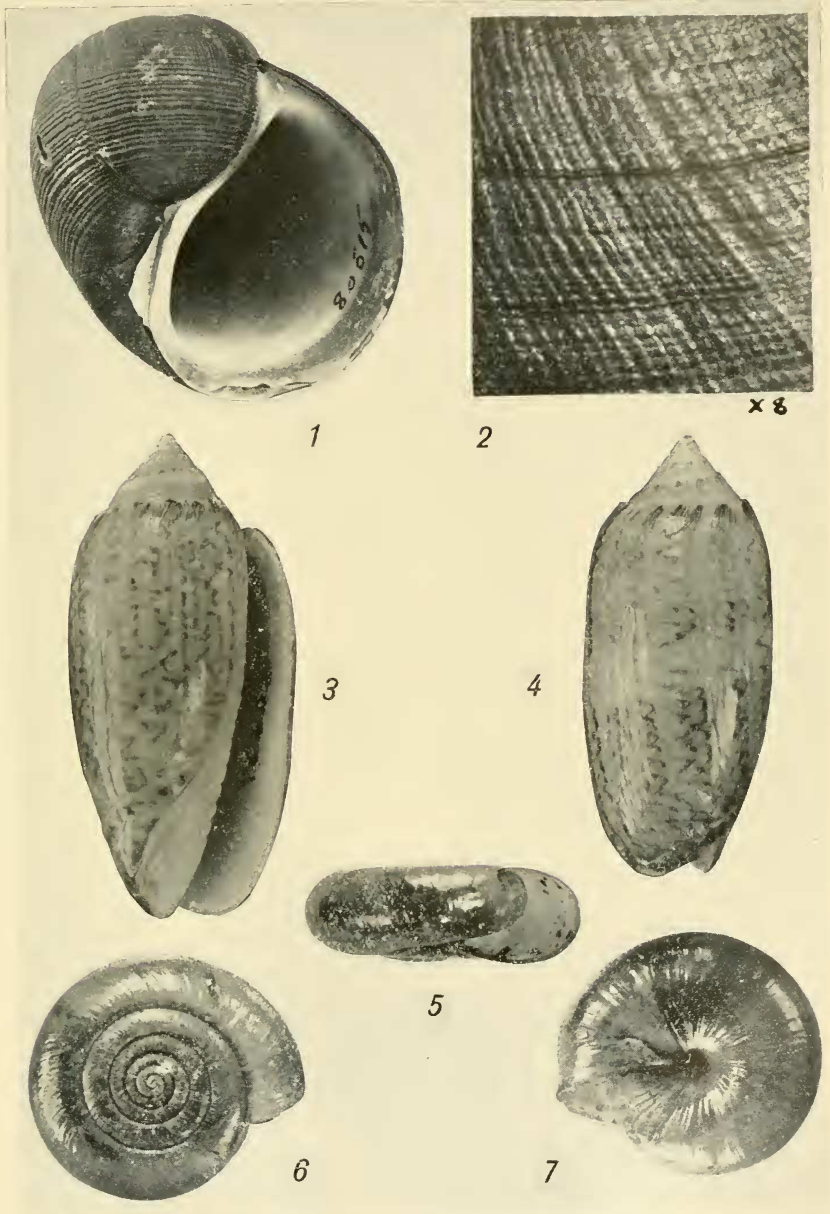
Remarks: *Surinamia* is provisionally placed in the genus *Asolene* until more definite knowledge relative to its soft parts is known. *Asolene* is without a breathing siphon, the lack of which is the main differential generic character from other Ampullariids. If *Surinamia* is found to possess such a siphon, its taxonomic position would then not be in *Asolene* but in *Pomacea*, and probably near to the subgenus *Limnopomus*. A recent paper by Pilsbry (Proc. Acad. Nat. Sci. Phila., 1933, 85, p. 74-75), summarizes our knowledge of *Asolene* and lists all of the known forms. This is the first record of any member of this genus north of the Rio de la Plata drainage.

THE PEDAL PROTRACTOR MUSCLE SCAR IN SHELLS OF NAIADES

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One object of these notes is to call attention to the fact that the relation of the position of the protractor scar to the position of the anterior adductor scar is of more importance than is generally known.

Lea, in his description of "*Unio*" *quadrans*, stated that it came from Texas, is nearly allied to *berlandierii*, and has the anterior cicatrices confluent. Simpson (1900) expressed doubt that the shell came from Texas and thought that it was a South American shell allied perhaps to *Diplodon apprimus*, *D. uruguayensis*, and possibly to Hupé's "*Unio*" *orbigny*. He classified it as a *Diplodon*, making it the only member of the group of *D. quadrans*. In dealing with this species (1914) he made the following statement: "This shell, which is in the Wheatley collection [now No.



1, 2. *Asolene* (*Surinamia*) *fairchildi* Clench.
5, 6, 7. *Mesomphix subplanus planus* Banks.

125601 A.N.S.P.], is supposed to have come from Texas. Nothing like it has been reported by any one else from that State, and there seems to be nothing from the Texan or Mexican region that is in any way related to it. The umbonal region is so eroded that no traces of beak sculpture remain, but the character of the teeth, the general appearance, color and sculpture seem to ally it to the forms of South America."

In both 1900 and 1914, Simpson in his definition of the group of *Diplodon quadrans* stated that the anterior cicatrices are confluent, but as shown in his remarks quoted above, he did not use this character to differentiate the shell from the naiads of Texas and Mexico. Recently I had occasion to determine, if possible, whether *quadrans* really came from Texas as stated by Lea, or is a South American shell as believed by Simpson. At first it seemed that it was closely related to *Lampsilis berlandierii*, as indicated by Lea, and by a little stretch of characters it appeared to almost fit that species. But the confluence of the protractor scar with the anterior adductor scar, did not agree with any Texan naiad, and upon comparing the character of these scars in *Diplodon* with those in the North American naiads it became apparent at once that *quadrans* did not come from North America but probably from South America, as supposed by Simpson. It is almost certain that this is the case. Nearly all the naiads which have cardinal and lateral teeth and which come from North America, or from nearly any part of the world except South America and the Australian region, have the protractor scar distinctly separated from the anterior adductor scar, and they are nearly always a considerable distance apart, or if near together, they are divided by a distinct barrier which keeps them separated. Every species of *Diplodon*, whether it comes from South America or from the Australian region, has the protractor scar confluent with the anterior adductor scar, and in the animal these two muscles evidently lie against each other. What part of the combined scar was formed by the protractor and what part was formed by the adductor is usu-

ally indicated in some way. As a rule, the surface of the protractor scar is a little elevated above that of the adductor scar. Sometimes they are on the same level, but a difference in looping of the growth lines of the two scars will point out which is which. Other times there is merely an optical difference showing where the two muscles lay in contact on the surface of the shell.

Haas (1930, p. 37) also considers "*Unio*" *quadrans* Lea a *Diplodon* and treats it as a synonym of *Diplodon fontainianus* Orbigny. He places also "*Unio*" *rufofuscus* Lea in the same synonymy. In this treatment of these three species, Haas has been as unfortunate as he was in his treatment of the synonymy of many other species, as for instance *Anodontites crispata* Bruguière in 1931. In the present instance all three of the guesses involved were incorrect. *U. fontainianus* is not the same as either of the other two species, and they are not the same as each other. *U. fontainianus* is a typical *Cyclomya* and has a very round shell. *U. quadrans* is not a *Cyclomya*, has a form which may be described as rhomboid or quadrate, and is probably related to *Diplodon apprimus* Lea, as suggested by Simpson. *U. rufofuscus* is a much smaller shell; it also is quadrate or rhomboid; its beaks are granosely radiately ornamented to such an extent that probably some of this ornamentation would show on *quadrans* if its beaks were similarly ornamented. Another difference between the two is that in *rufofuscus* the pallial line anteriorly terminates where the protractor scar joins the anterior adductor scar, while in *quadrans* it runs to the anterior side of the adductor scar. The differences between *fontainianus* and *rufofuscus* are self-revealing and need not be pointed out.

As in several other cases in which I have called attention to the value of apparently unimportant details, the remarks about the relative position of the protractor scar indicate that it, too, is of considerable importance.

In this connection it is interesting to note that Simpson did not give particular attention to the relation of the position of the two scars to each other. He did not use it as a